

REMARKS

35 USC § 103 - Indira

Claims 1-2 and 12-18 were rejected under 35 USC § 103 as being obvious over Indira et al. ("Chemical Polishing of Metals : A Study", pp 80-91). The applicant opposes the rejections, especially in view of the amendments herein.

At the outset it should be appreciated that Indira relates to chemical polishing (CP) agents, not chemical mechanical polishing (CMP) agents, and there is no teaching, suggestion, or motivation in Indira or any of the other cited art to use CP agents as CMP agents. The most that can be said is that Indira refers to CP agents as having "some similarity to electropolishing agents" (page 80, 3rd para.), and one could therefore extrapolate that CMP agents might have some similarity to CP agents. But in all fairness that statement actually teaches away from using agents from one polishing system in another polishing system agents because of the word "some similarity".

Even within the same system of CP, Indira teaches that what constitutes a useful polishing agent is entirely dependent upon the material being polished. This is made abundantly clear by tables I, II and III, which separate out the various materials being polished in alphabetical order, going from Aluminum, Cadmium, Copper, and Copper alloys . . . to Tantalum, Titanium, and Zinc.

Three things are especially significant in these tables. First, there is some overlap in the recited formulas, since both Tantalum and Titanium are described as being polished with a combination of sulfuric acid, nitric acid, and hydrofluoric acid. One can thus conclude that Indira is listing overlapping mixtures where they are appropriate. Second, there is no overlap at all between the agents listed for Copper and those listed for Tantalum - which means that Indira does not know of any combination that would be appropriate for both Copper and Tantalum. Third, it should also be noted that the agents for Copper differ from the agents for copper alloys. From that fact Indira is apparently teaching that polishing agents appropriate for a metal are not

appropriate (or at least not necessarily appropriate) for alloys of the metal. From these three observations one of ordinary skill could only conclude that there are no known agents or combinations of agents that can be used for Copper, Tantalum, and Tantalum alloys. Yet that is what was claimed, "An etching solution for chemical mechanical planarization of a Cu/Ta/TaN surface"

Now, it is true that recital of a purpose in the preamble of a composition claim ("for chemical mechanical planarization of a Cu/Ta/TaN surface") is normally given little or no patentable weight. Claim 1 (and claims 12-18 by virtue of their dependence on claim 1) is therefore amended herein to recite that the etching solution is a replacement solution for a "chemical mechanical planarization system that includes a Cu/Ta/TaN surface".

After this amendment, it should be quite clear that Indira neither anticipates nor renders claim 1 (and its progeny) obvious. Indira does not teach, suggest, or motivate a system that includes both a Cu/Ta/TaN surface and the claimed etching solution. In fact, as now worded, Indira actually teaches against the present claims because the compositions that Indira teaches for polishing copper are not favored for polishing tantalum, and *visa versa*. For example, a combination of nitric and phosphoric acids are suggested for use on copper but not tantalum, while a combination of nitric and sulfuric acids are suggested for use on tantalum but not copper.

35 USC § 103 - Kaufman

Claim 2 was rejected under 35 USC § 103 as being obvious over Kaufman et al. (US 6063306). This rejection is obviated by cancellation of claim 2.

Even without cancellation, however, the rejection would be inappropriate. Kaufman does indeed teach aspects of chemical mechanical polishing that involve Ta/TaN/Cu polishing. (spec. col. 4, lines 15-20 and lines 36-42). But such polishing necessarily involves two steps (see abstract, and specification generally). The present claims have all been amended to recite a single step (directly or by virtue of dependency). Reference to the single step is found

throughout the pending specification, including page 7, lines 5-14. In view of the amendments, Kaufman teaches squarely against all pending claims.

35 USC § 103 - Grossman

Claims 4-7 and 10 were rejected under 35 USC § 103 as being obvious over Grossman et al. ("A New Etchant for Thin Films of Tantalum and Tantalum Compounds", vol. 116, No. 5, pp 674). This rejection is obviated by cancellation of claims 4-7 and 10.

On a minor note, the paragraphs explaining the rejection refer to Indira. We assume this to be a typographical error.

Substantively, the rejections would be inappropriate even without cancellation of the rejected claims. This is because the amended claims clearly recite a system or method that includes both a Cu/Ta/TaN surface and the claimed etching solution. In view of Indira and Kaufman, one of ordinary skill would not even try to use single-step processing of both Cu and Ta/TaN because they apparently need different solutions. It really is not enough to reject a claim by simply stating that one of ordinary skill would have found such and such to be obvious. The Office has a responsibility to identify a specific teaching, suggestion, or motivation to make the claimed combination. And the motivation cannot simply be "it would work better" or "its easier" because that would eviscerate the requirement.

There is plenty of case law on this topic, so we will just cite a few clear examples.

- *In re Rouffet, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998)* ("the Board must identify specifically . . . the reasons one of ordinary skill in the art would have been motivated to select [**11] the references and combine them");
- *In re Fritch, 972 F.2d 1260, 1265, 23 U.S.P.Q.2D (BNA) 1780, 1783 (Fed. Cir. 1992)* (examiner can satisfy burden of obviousness in light of combination "only by showing some objective teaching [leading to the combination]");

- *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297, 227 U.S.P.Q. (BNA) 657, 667 (Fed. Cir. 1985) (district court's conclusion of obviousness was error when it "did not elucidate any factual teachings, suggestions or incentives from this prior art that showed the propriety of combination").

35 USC § 103 - Indira

Claim 11 was rejected under 35 USC § 103 as being obvious over Indira et al. ("Chemical Polishing of Metals : A Study", pp 80-91). This rejection is mooted by cancellation, and is inappropriate in any event because (1) by separately listing the various materials to be polished, and (2) by providing inconsistent listings for Al, Cu, and Ta, Indira actually teaches against using a polishing composition designed for Al in a system or method used for polishing Cu/Ta/TaN surfaces.

35 USC § 103 - Allman

Claim 11 was further rejected under 35 USC § 103 as being obvious over Allman (US 5645736). This rejection is mooted by cancellation, and is inappropriate in any event because Allman does nothing to teach, suggest, or motivate one of ordinary skill in the art (who would be swayed by Indira's teaching of using different polishing compositions for different materials) to apply a polishing composition designed for something other than Cu/Ta/TaN, on a Cu/Ta/TaN containing surface.

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Honeywell's Docket No. 30-4790 (4780)
Practitioner's Docket No. 595.48-US1

Request For Allowance

Claims 1 and 12-32 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,

Fish & Associates, LLP

By:

Robert D. Fish
Reg. No. 33,880

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Attorneys for Applicant(s)
1440 N. Harbor Blvd., Suite 706
Fullerton, CA 92835
Tel.: (714) 449-2337
Fax: (714) 449-2339